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retina to light of different wave-lengths but of equal energy. This relation is known for a great number of subjects to a quite satisfactory precision. It establishes the ratio of the light unit to the energy unit, hence, is of fundamental importance in illuminating engineering. Strictly speaking, we can neither define nor measure light without it.

When it comes to measuring the light sensation caused by a given light impression, an apparently insurmountable difficulty is encountered, for a sensation can not be directly measured. The sensation is, however, the integral of the sensibility and the sensibility is proportional to the reciprocal of the just noticeable difference in intensity and this may readily be measured. The necessary data are being accumulated and before long we shall be able to formulate the general laws of the visual reaction to light intensity in the case of white light. Similar data relating intensity sensibility to color, intensity and time must next be obtained.

On entering a dark room we become able to distinguish objects after a shorter or longer interval of time depending upon various conditions not yet worked out. Rate of adaptation curves must be determined for all initial conditions of adaptation, not only for white light but more particularly for the reds, yellows and greens used in the safe lights of dark rooms.

Very little is yet known of the relation between visual acuity and the brightness of the object viewed. The ability to distinguish fine details is known to fall off rapidly with decreasing illumination, but we have not the data for the formulation of any laws.

Illuminating engineers require a mass of such data on the properties of the retina, for the eye is the sole means of judging whether lighting is good or bad and the

conditions for best seeing have been only very roughly worked out thus far. We require to know what illumination levels and what contrasts are best and what are the effects of excessive contrasts and oblique glare in depressing the sensibility of the retina.

The precise measurement of color is an almost unworked but important field of applied optics. The preliminary part of the work only has been done. The underlying theory has been roughed out, methods have been devised and precision colorimeters designed. But our fundamental color scales have been but partly worked out and the various laws of color combination are practically unknown. The work urgently requiring attention in this field amounts to quite a number of man-years.

Within the necessary limits of this discussion only the more urgent problems in the more important fields of applied optics could be reviewed. The special problems of refractometry, photometry, radiometry, interferometry, spectrophotometry, polarimetric analysis and other fields can not even be enumerated here. It is hoped, however, that this brief outline may have impressed upon us all the necessity for concerted effort in solving the numerous problems which confront us. We trust that the formation of this society will, by promoting team work and well directed research, prove to be a powerful factor in the advancement of applied optics. This city has long been a leader in the production of optical materials, may it become the great source of optical ideas and the recognized home of optical learning.

P. G. NUTTING

#### SCIENTIFIC NOTES AND NEWS

DR. WILLIAM W. KEEN has been reelected president of the American Philosophical Society for 1916. The vice-presidents, Professors William B. Scott, Albert A. Michelson and

Edward C. Pickering have also been reelected.

PROFESSOR R. A. MILLIKAN, of the University of Chicago, was elected president of the American Physical Association at the recent Columbus meeting.

THE officers of the American Society of Naturalists for 1916 are: *President*, Raymond Pearl; *vice-president*, Albert F. Blakeslee; *secretary*, Bradley M. Davis; *treasurer*, J. Arthur Harris; additional members of the *executive committee*, Edward M. East, Henry V. Wilson, Frank R. Lillie. The society has ordered an appropriation of \$200 for the Concilium Bibliographicum, Zurich.

NEWS has been received from Sweden that the actual delivery of the Nobel prize in chemistry for 1914, awarded to Professor Theodore W. Richards, of Harvard University, together with the other Nobel prizes for 1914 and 1915, will be postponed until June 1 of this year. The prize-winners are invited to go then to Sweden in person to receive their prizes, and to give their Nobel lectures.

THE Leeuwenhoek medal of the Netherlands Academy of Sciences, awarded to Surgeon-General Sir David Bruce, F.R.S., A.M.S., was presented to him on December 24 by the Netherlands Minister to Great Britain. The medal was founded in 1875, on the occasion of the Leeuwenhoek celebration in Delft, and is presented every ten years. It was awarded to Ehrenberg in 1875, to Ferdinand Cohn in 1885, to Louis Pasteur in 1895, and to Beyerinck in 1905.

DR. LAZARUS FLETCHER, F.R.S., director of the Natural History Departments of the British Museum, has been knighted.

PROFESSOR IRVING PORTER CHURCH will retire from the faculty of the college of civil engineering of Cornell University at the close of the current academic year, when he will be sixty-five years old. The board of trustees has adopted a resolution expressing its sense of the university's debt to Professor Church.

PROFESSOR C. FRANK ALLEN, who has held the chair of railroad engineering in the Massachusetts Institute of Technology since 1887, will retire under the benefits of the Carnegie

Foundation at the close of the present academic year.

PROFESSOR R. B. CLINTON, who lately retired from the professorship of experimental philosophy at Oxford at the end of his fiftieth year of service, has been elected to an honorary fellowship at Wadham College.

THE Draper Committee of the National Academy of Sciences has granted \$300 to Professor Joel Stebbins, head of the department of astronomy of the University of Illinois, in support of his researches at the observatory. The special work which is now being carried on at the observatory is the improvement of his method of measuring the light of stars, which is being developed in collaboration with Professor Jacob Kunz of the department of physics.

AT its meeting of January 12, the Rumford Committee of the American Academy of Arts and Sciences appropriated the sum of \$200 to Professor H. M. Randall, of the University of Michigan, in aid of his researches on the infra-red spectrum, the grant to be used to defray the salary of an assistant.

DR. WILLIAM DEB. MACNIDER, professor of pharmacology at the University of North Carolina, has been notified of an award of \$250 by the trustees of the Rockefeller Institute to enable him to continue his research work in pharmacology.

DR. FREDERICK E. DILLEY ('03, Western Reserve), instructor in surgery, Union Medical College, Peking, China, has arrived for post-graduate work in Cleveland until next August.

DR. KARL H. VAN NORMAN, formerly of the Johns Hopkins Hospital and now a captain in the Royal Canadian Army Medical Corps, is in charge of a British hospital division at Ramsgate, England.

DR. HUGH M. SMITH, commissioner of fisheries, was elected honorary president of the Washington Aquarium Society at an organization meeting held on January 21. Other officers elected were: *President*, Dr. R. W. Shufeldt; *First Vice-president*, L. W. Bauer; *Second Vice-president*, Mrs. L. Helen Fowler;

*Corresponding Secretary*, J. Henri Wagner, and *Financial Secretary and Treasurer*, E. S. Schmidt. The following committee was elected to prepare a constitution and by-laws: Dr. Paul. Bartsch, chairman, Miss Mary C. Breen, Mrs. G. H. Burris, W. S. Adams and J. E. Benedict.

AN intensive study of the question of pneumonia will be made by a commission appointed on January 11, by Director Wilmer Krusen, of the Department of Health and Charities of Philadelphia. The recent epidemic of grip and pneumonia occasioned the appointment of a commission. Director Krusen appointed the members from those eminent either for clinical work or for their ability as laboratory research workers. The city laboratories will be placed at their disposal. Dr. David Riesman, professor of clinical medicine in the University of Pennsylvania and the Philadelphia Polyclinic, will be chairman. Other members are: Dr. Hobart A. Hare, professor of therapeutics at Jefferson Medical College; Dr. Judson Daland, professor of clinical medicine in the Medico-Chirurgical College; Dr. William Egbert Robertson, professor of the practice of medicine, Temple University; Dr. Randle C. Rosenberger, professor of hygiene and bacteriology in the Jefferson Medical College and the Women's Medical College; Dr. Paul A. Lewis, director of the Ayer Clinical Laboratory of the Pennsylvania Hospital and director of the pathological department of the Henry Phipps Institute, and Dr. John A. Kolmer, professor of pathology, Philadelphia Polyclinic; instructor of experimental pathology at the University of Pennsylvania.

THE mental hygiene committee of the New York State Charities Aid Association announces that, in the interest of a state-wide campaign of education for the prevention of insanity, plans have been made for public lectures. Specialists in mental diseases have been appointed to deliver such lectures, including Drs. Stewart Paton, Smith Ely Jelliffe, August Hoch, Thomas Henry Williams, Menas S. Gregory, Charles S. Little, Thiells,

William Mabon, James V. May and Herman G. Matzinger.

At the recent biennial convention of the honor society of Phi Kappa Phi, the following officers were elected: *President General*, Edwin E. Sparks, State College, Pa.; *Secretary General*, L. H. Pammel, Iowa State College, Ames; *Treasurer General*, C. H. Gordon, University of Tennessee, Knoxville; *Registrar General*, J. S. Stevens, University of Maine, Orono; *Provincial Secretaries*: Eastern District, J. A. Foord, Massachusetts Agricultural College, Amherst; Southern District, G. H. Boggs, Georgia School of Technology, Atlanta; Northern District, E. N. Wentworth, Kansas Agricultural College, Manhattan; Western District, L. W. Hartman, University of Nevada, Reno. The constitution was revised and other important business was transacted.

DR. WILLIS T. LEE, of the U. S. Geological Survey, is giving a course of ten lectures at the Johns Hopkins University on successive Monday and Tuesday afternoons. His subject is "Mesozoic Physiography of the Southern Rocky Mountains."

IN the new Bowdoin Union, Bowdoin College, not yet dedicated formally, the first public lecture was given on January 17 by Professor George H. Parker, of Harvard University, who gave an illustrated address on "The Seals of the Pribiloff Islands," under the auspices of the Biological Club.

DR. K. GEORGE FALK, of the Harriman Research Laboratory of the Roosevelt Hospital, delivered a lecture on "The Electron Conception of Valence," before the Chemical Society of the College of the City of New York on December 22.

DR. CHARLES H. T. TOWNSEND gave an illustrated lecture on verruga to the students of the medical school of Howard University, Washington, D. C., on January 15.

A MEMORIAL of Eustachius was recently unveiled in the great quadrangle of the University of Rome in the presence of the prime minister, the minister of public instruction, the mayor of Rome, and the rector and mem-

bers of the senate of the university. The memorial, which is a bronze tablet attached to one of the pillars of the upper portico, near a marble memorial of Victor Emanuel II., represents Eustachius in his professor's robes in the act of lecturing; he holds in his left hand a human skull and the right arm rests on tables showing the structure of the ear.

JOHN OREN REED, professor of physics in the University of Michigan, and until a year ago dean of the college of literature, science and arts, died on January 23, at the age of sixty years.

CHARLES VICTOR MAPES, an industrial agricultural chemist of New York City, died on January 23, in his eightieth year.

DR. ALFRED J. NOBLE, superintendent of the Michigan State Hospital in Kalamazoo, an authority on insanity, died on January 20, aged fifty-eight years.

THE death is announced at the age of forty-nine years of Professor Donaldson Bodine, who held the chair of geology and zoology at Wabash College.

MR. A. D. DARBISHIRE, lecturer on genetics in the University of Edinburgh, known by his experiments bearing on the laws of heredity, and his book on "Breeding and the Mendelian Discovery," died on December 26, 1915.

MR. H. A. TAYLOR, a distinguished English electrical engineer, known especially for his work on submarine cables, has died at the age of seventy-four years.

DR. FRITZ REGEL, professor of geography at Würzburg, died on December 2, aged sixty-two years.

DR. GEORGE OLIVER, an English physician, known for his valuable researches on the circulation of the blood, has died at the age of seventy-four years.

THE ninth annual meeting of the Illinois Academy of Science will be held at the University of Illinois, Urbana, Friday and Saturday, February 18 and 19, 1916. The program will be as follows:

Friday, 1 o'clock P.M.—Meetings of all committees.  
Friday, 2 o'clock P.M.—Business and symposium on astronomy.

Friday, 6 o'clock P.M.—Dinner. Ten minute address upon the work, policy and value of the academy.

Friday, 8 o'clock P.M.—President's address and reception.

Saturday, 9 o'clock A.M.—General papers and sectional meetings.

Saturday, 12 noon—Luncheon.

Saturday, 1:30 o'clock P.M.—Inspection of the university buildings.

Saturday, 2:30 o'clock P.M.—General papers, election of officers and other business.

If papers presented render it advantageous, the academy will be divided into the following sections: (1) astronomy, mathematics, physics; (2) bacteriology, botany; (3) zoology, physiology, medicine; (4) chemistry, agriculture; (5) geology, geography; (6) archeology. The following are the Urbana committees: Hotels, Professor S. A. Forbes, chairman; Local Arrangements, Professor G. D. Beal, chairman; Entertainment, Professor C. R. Richards, chairman; Publicity, W. H. Stoek, chairman; Papers, W. S. Bayley, chairman.

On January 7 and 8, a number of professional geologists of the southwest met at Norman, Oklahoma, for a two days' conference. The conference was called for the purpose of presenting and discussing various topics of interest to those geologists engaged in the petroleum industry. The conference was attended by forty visiting geologists and fifty major students and members of the faculty of the department of geology of the University of Oklahoma. The meeting was presided over by Charles H. Taylor, head of the department of geology of the University of Oklahoma, who was responsible for calling the conference. A number of profitable papers were read. Dr. van Waterschoot van der Gracht, director of the Netherlands Geologic Service, presented a paper on the Salt Domes of Northern Europe. Mr. E. L. DeGolyer, chief geologist for the Pearson Syndicate, presented a paper on the geology of Northwest Texas. Mr. A. W. McCoy, instructor of geology at the University of Oklahoma, read a paper on Capillarity Underground. Other geologists who appeared on the program were Dr. J. A. Udden, director of Texas Geological Bureau; C. W. Shannon,

director of the Oklahoma Geological Survey; R. A. Conkling, chief geologist, Roxana Petroleum Company; L. E. Trout, chief geologist, Maryland Oil Company; C. N. Gould and Harper McKee, consulting geologists; and M. G. Mehl, W. C. Kite and Charles H. Taylor, of the department of geology, University of Oklahoma. Much interest was shown in the reading and discussion of these papers. No organization was formed, but Professor Charles H. Taylor and Director C. W. Shannon were elected a committee to arrange for another similar meeting to be held at Tulsa, Oklahoma, at some future date.

THE London correspondent of the *Journal* of the American Medical Association writes that the British authorities have decided that students in the fourth and fifth years of study should complete their course as rapidly as possible but that students in the first, second and third year should join the army. The effect of recruiting is shown by the statistics of ten leading medical schools, in which, during the first year of the war, the number of students was 1,891, as compared with the normal number of 2,562. The number of medical students who have entered Cambridge University this year is forty-one, as compared with 116 in the year 1913. The director general of the Army Medical Corps has asked for an additional 2,000 physicians before Christmas for war service. The casualty lists of one week show the names of fifteen physicians, and the obituary lists of physicians killed usually three or four. Sir D. Macalister, in his presidential address at the opening of the present session of the General Medical Council, said that within the next few months every qualified man of suitable age who was fit for the work of an officer in the medical corps would be needed. From the British dominions and from other countries over 240 physicians had been registered this year, and when certain reciprocity arrangements had been completed, the number from Canada would be considerably increased. Although the War Office authorities recognized that the withdrawal from professional instruction of large numbers of medical students, of the first years, would have a

serious effect on the future, they had deemed it inadvisable to discourage junior students who offered themselves for combatant service. The result of medical students accepting commissions and enlisting was that the prospective shortage of 250 qualified practitioners per annum, which he had mentioned on a former occasion as probable during the coming years, would almost certainly be exceeded. There was one direction in which it appeared likely some economy of medical students might be effected. The minor vessels of the fleets carried a surgical "probationer," and for this work medical students who had completed their physiologic and anatomic studies and had been instructed in surgical dressing are preferred. He was authorized to make it known that any "probationer," who after, say, six months' service, desired to present himself for a professional examination or to resume his studies, would be granted leave of absence or be demobilized, and a less senior student be appointed in his place. By such rotation of service, a succession of students might continue to be employed in war work and yet the qualification of none would be unduly delayed.

*Nature* says: "The accounts of the local committee of the Manchester meeting of the British Association, held in September, lately issued, show that the resolution to observe the strictest economy in view of the exceptional circumstances in which the meeting was held was faithfully kept, and the local officers are to be heartily congratulated on the success of their efforts in this as in other directions. The expenditure amounted to only £862 15s., and 22 per cent. was all that it was necessary to ask from the guarantors. On the occasion of the previous meeting, in 1887, the expenses reached £3,652, and 35 per cent. of the much larger guarantee fund was called up. The meeting was in every way a success; it was attended by many eminent scientific men, the papers and discussions were of high value, and the arrangements gave such satisfaction that at the concluding meeting of the general committee many influential members expressed the hope that future meetings might be "run" on the same lines, excluding much of the lavish

and costly expenditure on entertainments and excursions.

### UNIVERSITY AND EDUCATIONAL NEWS

ANNOUNCEMENT of a gift of \$250,000 for a library for Amherst College was made at the annual banquet of the Amherst Alumni Association of New York. The library is to be a memorial to a graduate of the class of 1867 from a brother whose name is withheld.

A GIFT of \$150,000 from a graduate of Wellesley College toward the fund for a new administration building is announced. The donor does not wish her name made known at this time.

PRELIMINARY plans for the chemistry building at Throop College of Technology, in Pasadena, have been completed, and the architects, Mr. Elmer Grey, of Los Angeles, and Mr. Bertram G. Goodhue, of New York City, are at work on the complete detailed plans and specifications of the building. The building is to cost \$60,000 and construction will be begun probably within thirty days. The building is to be ready for occupancy next September, and Dr. Arthur A. Noyes will inaugurate his research work in the new laboratory about December, 1916. He has just returned to Boston after a few weeks' stay in Pasadena, which time was spent in working out plans for the building, and for the development of the department of chemistry, and the special research laboratories.

It is announced that a group of prominent dentists of New York City some months ago submitted to Columbia University a detailed proposal to create a dental school. The proposal has the approval of the faculty of the college of physicians and surgeons. Candidates for admission would be required to possess the same academic training as students entering the study of medicine at Columbia, namely, the completion of two years of work in an undergraduate college.

DR. J. T. KINGSBURY, president of the University of Utah, has presented his resignation to take effect at the end of the present acad-

emic year. It will be remembered that the administration of the University of Utah, which led to the resignation of seventeen members of the faculty last spring, has been reviewed and criticized in a report of a committee of enquiry of the American Association of University Professors.

DR. KATE GORDON, head of the department of education, Bryn Mawr College, goes next September to the Carnegie Institute of Technology, Pittsburgh, where she will have charge of the Bureau of Mental Tests and give instruction in psychology in the woman's department of the School of Applied Design.

AT Yale University, Henry Laurens, Ph.D., has been promoted to an assistant professorship of biology in Yale College.

DR. V. E. EMMEL, of the Washington University Medical School, St. Louis, Mo., has been appointed assistant professor of anatomy in the University of Illinois college of medicine, Chicago, Ill.

### DISCUSSION AND CORRESPONDENCE INSECTS IN THEIR RELATION TO THE CHESTNUT BARK DISEASE

A RECENT bulletin<sup>1</sup> of the Department of Forestry of the commonwealth of Pennsylvania discusses the relation of insects to the bark disease. This paper bears the title, "Insects as Carriers of the Chestnut Blight Fungus," and as such tabulates a number of insects collected and found carrying spores of this parasite. Tests were made on some seventy-five insects representing about twenty-five species. Of these, fifty-two were collected while on chestnut blight cankers. From these experiments it was found that thirty per cent. of these insects carried numbers of the pycnosporos of this fungus on their bodies and that the highest counts by far were obtained from the spore-feeding longicorn beetle *Leptostylus macula* Say.

The citation of these results as proof merely that insects are carriers of the chestnut blight spores is entirely justifiable, but in drawing

<sup>1</sup> Studhalter and Ruggles, Bull. 12, Dept. Forestry, Commonwealth of Pennsylvania, 1915.